

230295.sequence listing
 SEQUENCE LISTING

<110> LOBANENKOV, VICTOR V
 LOUKINOV, DMITRI I
 MORSE, HERBERT C

<120> BROTHER OF THE REGULATOR OF IMPRINTED SITES (BORIS)

<130> 230295

<150> PCT/US03/05186

<151> 2003-02-21

<150> US 60/358,889

<151> 2002-02-22

<160> 49

<170> PatentIn version 3.1

<210> 1

<211> 3541

<212> DNA

<213> Homo sapiens

<400> 1

accctccact ctcgcgccag cccggcggcg gccggctgtg ggctgcagca cgcggtgcac	60
gaggcagagc cacaagccaa agacggagtg ggccgagcat tccggccacg ctttcgcgcg	120
ccaagtcatt atggcagcca ctgagatctc tgtcctttct gagcaattca ccaagatcaa	180
agaactcgag ttgatgccgg aaaaaggcct gaaggaggag gaaaaagacg gagtgtgcag	240
agagaaagac catcggagcc ctagtgagtt ggaggccgag cgtacctctg gggccttcca	300
ggacagcgtc ctggaggaag aagtggagct ggtgctggcc ccctcggagg agagcgagaa	360
gtacatcctg accctgcaga cggcgcactt cacttctgaa gctgtggagt tgcaggatat	420
gagcttgctg agcatacagc agcaagaagg ggtgcaggtg gtggtgcaac agcctggccc	480
tgggttgctg tggcttgagg aagggccccg gcagagcctg cagcagtgtg tggccattag	540
tatccagcaa gagctgtact ccccgcaaga gatggaggtg ttgcagttcc acgctctaga	600
ggagaatgtg atggtggcca gtgaagacag taagttagcg gtgagcctgg ctgaaactgc	660
tggactgatc aagctcgagg aagagcagga gaagaaccag ttattggctg aaagaacaaa	720
ggagcagctc ttttttgctg aaacaatgtc aggagatgaa agaagtgcg aaattgttct	780
cacagtttca aattcaaatg tggaagaaca agaggatcaa cctacagctg gtcaagcaga	840
tgctgaaaag gccaaatcta caaaaaatca aagaaagaca aaggagcaa aaggaacctt	900
ccactgtgat gtctgcatgt tcacctcttc tagaatgtca agttttaatc gtcatatgaa	960
aactcacacc agtgagaagc ctcacctgtg tcacctctgc ctgaaaacct tccgtacggt	1020
cactctgctg cggaaccatg ttaacaccca cacaggaacc aggccctaca agtgtaacga	1080
ctgcaacatg gcatttgtca ccagtggaga actcgtccga cacaggcgct ataaacatac	1140

230295.sequence listing

tcatgagaaa	ccctttaaat	gttccatgtg	caagtatgcc	agtgtggagg	caagtaaatt	1200
gaagcgccat	gtccgatccc	acactgggga	gcgccccttt	cagtgttgcc	agtgcagcta	1260
tgccagcaga	gatacctaca	agctgaaacg	ccacatgaga	acgcactcag	gtgagaagcc	1320
ttacgaatgc	cacatctgcc	acacccgctt	cacccagagc	gggaccatga	aaatacatat	1380
tctgcagaaa	cacggcgaaa	atgtcccca	ataccagtgt	ccccattgtg	ccaccatcat	1440
tgcacggaaa	agcgacctac	gtgtgcatat	gcgcaacttg	catgcttaca	gcgctgcaga	1500
gctgaaatgc	cgctactgtt	ctgctgtctt	ccatgaacgc	tatgccctca	ttcagcacca	1560
gaaaactcat	aagaatgaga	agaggttcaa	gtgcaaacac	tgcagttatg	cctgcaagca	1620
ggaacgtcat	atgaccgctc	acattcgtac	ccacactgga	gagaaaccat	tcacctgcct	1680
ttcttgcaat	aaatgtttcc	gacagaagca	acttctaaac	gctcacttca	ggaaatacca	1740
cgatgcaaat	ttcatcccga	ctgtttacaa	atgctccaag	tgtggcaaag	gcttttcccg	1800
ctggattaac	ctgcacagac	attcggagaa	gtgtggatca	ggggaagcaa	agtcggctgc	1860
ttcaggaaaag	ggaagaagaa	caagaaagag	gaagcagacc	atcctgaagg	aagccacaaa	1920
gggtcagaag	gaagctgcga	agggatggaa	ggaagccgcg	aacggagacg	aagctgctgc	1980
tgaggaggct	tccaccacga	agggagaaca	gttcccagga	gagatgtttc	ctgtcgcctg	2040
cagagaaacc	acagccagag	tcaaagagga	agtggatgaa	ggcgtgacct	gtgaaatgct	2100
cctcaacacg	atggataagt	gagagggatt	cgggttgctg	gttactgcc	ccaattcct	2160
aaagcaagtt	agaagttttt	agcatttaag	gtgtgaaatg	ctcctcaaca	cgatggataa	2220
gtgagagaga	gtcagggttg	atgttctactg	cccctaattc	ctaaagcaag	ttagaaattt	2280
ttagcatttt	ctttgaaaca	attaagttca	tgacaatgga	tgacacaagt	ttgaggtagt	2340
gtctagaatt	gttctcctgt	ttgtagctgg	atattttcaa	gaaacattgc	aggtattttta	2400
taaaagtttt	aaaccttgaa	tgagagggta	acacctcaaa	cctatggatt	cattcacttg	2460
atattggcaa	ggtggccac	aatgagtgag	tagtgatttt	tggatatttc	aaaatagtct	2520
agaccagcta	gtgcttcac	agtcaaagct	ggacattttt	atgttgcat	atatacacc	2580
atgatatttc	taataatata	tggtttttaa	cattaaagac	aaatgttttt	atacaaatga	2640
attttctaca	aaattttaaag	ctaccataat	gcttttaatt	agttctaaat	tcaacaaaaa	2700
aatgtttttac	tcttataaaa	aggaaaactg	agtaggaaat	gaaatactag	attagactag	2760
aaaataagga	ataaatcgat	tttactttgg	tataggagca	aggttcacct	ttagattttt	2820
gtatttctct	ttaattatgc	tccttggcag	gtatgaaatt	gccctgggta	cattccatta	2880
ttgcttatta	gtatttcact	ccataaccct	tttttctgct	aaaactactc	tttttatatt	2940
tgtaaaataa	ttggcagagt	gagaagaac	ataaaatcag	ataaggcaaa	tgtgtacctg	3000

230295.sequence listing

taaggaattt gtactttttc ataatgccca gtgattagtg agtattttccc ttttgccagt	3060
tgacaagatt tttccaccct cgagcagcgt gagagatgcc tctttaacac ttgaaattca	3120
tttctatctg gatacagagg cagatttttc ttcattgctt agttgagcag tttgttttgc	3180
tgccaacctg tctccacccc tgtattttcaa gatcattgat aagccctaaa ttcaaattct	3240
taagatatgg accttttatt gaaaatatca caagttcaga atccctatac aatgtgaata	3300
tgtggaaata atttcccagc aggaagagca ttatatcttc tttgtaccag caaattaatt	3360
taactcaact cacatgagat ttaaattctg tgggctgtag tatgccatca ttgtgactga	3420
atttgtgcaa tggttttcta atttttttac tgttatttaa agatgtttta cataattcaa	3480
taaaatgaaa tgacttaaaa ttgcaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa	3540
a	3541

<210> 2
 <211> 663
 <212> PRT
 <213> Homo sapiens

<400> 2

Met	Ala	Ala	Thr	Glu	Ile	Ser	Val	Leu	Ser	Glu	Gln	Phe	Thr	Lys	Ile
1				5					10					15	

Lys	Glu	Leu	Glu	Leu	Met	Pro	Glu	Lys	Gly	Leu	Lys	Glu	Glu	Glu	Lys
			20					25					30		

Asp	Gly	Val	Cys	Arg	Glu	Lys	Asp	His	Arg	Ser	Pro	Ser	Glu	Leu	Glu
		35					40					45			

Ala	Glu	Arg	Thr	Ser	Gly	Ala	Phe	Gln	Asp	Ser	Val	Leu	Glu	Glu	Glu
		50				55					60				

Val	Glu	Leu	Val	Leu	Ala	Pro	Ser	Glu	Glu	Ser	Glu	Lys	Tyr	Ile	Leu
65					70					75					80

Thr	Leu	Gln	Thr	Val	His	Phe	Thr	Ser	Glu	Ala	Val	Glu	Leu	Gln	Asp
				85					90					95	

Met	Ser	Leu	Leu	Ser	Ile	Gln	Gln	Gln	Glu	Gly	Val	Gln	Val	Val	Val
			100					105					110		

Gln	Gln	Pro	Gly	Pro	Gly	Leu	Leu	Trp	Leu	Glu	Glu	Gly	Pro	Arg	Gln
		115					120					125			

Ser	Leu	Gln	Gln	Cys	Val	Ala	Ile	Ser	Ile	Gln	Gln	Glu	Leu	Tyr	Ser
	130					135					140				

230295.sequence listing

Pro Gln Glu Met Glu Val Leu Gln Phe His Ala Leu Glu Glu Asn Val
 145 150 155 160
 Met Val Ala Ser Glu Asp Ser Lys Leu Ala Val Ser Leu Ala Glu Thr
 165 170 175
 Ala Gly Leu Ile Lys Leu Glu Glu Glu Gln Glu Lys Asn Gln Leu Leu
 180 185 190
 Ala Glu Arg Thr Lys Glu Gln Leu Phe Phe Val Glu Thr Met Ser Gly
 195 200 205
 Asp Glu Arg Ser Asp Glu Ile Val Leu Thr Val Ser Asn Ser Asn Val
 210 215 220
 Glu Glu Gln Glu Asp Gln Pro Thr Ala Gly Gln Ala Asp Ala Glu Lys
 225 230 235 240
 Ala Lys Ser Thr Lys Asn Gln Arg Lys Thr Lys Gly Ala Lys Gly Thr
 245 250 255
 Phe His Cys Asp Val Cys Met Phe Thr Ser Ser Arg Met Ser Ser Phe
 260 265 270
 Asn Arg His Met Lys Thr His Thr Ser Glu Lys Pro His Leu Cys His
 275 280 285
 Leu Cys Leu Lys Thr Phe Arg Thr Val Thr Leu Leu Arg Asn His Val
 290 295 300
 Asn Thr His Thr Gly Thr Arg Pro Tyr Lys Cys Asn Asp Cys Asn Met
 305 310 315 320
 Ala Phe Val Thr Ser Gly Glu Leu Val Arg His Arg Arg Tyr Lys His
 325 330 335
 Thr His Glu Lys Pro Phe Lys Cys Ser Met Cys Lys Tyr Ala Ser Val
 340 345 350
 Glu Ala Ser Lys Leu Lys Arg His Val Arg Ser His Thr Gly Glu Arg
 355 360 365
 Pro Phe Gln Cys Cys Gln Cys Ser Tyr Ala Ser Arg Asp Thr Tyr Lys
 370 375 380
 Leu Lys Arg His Met Arg Thr His Ser Gly Glu Lys Pro Tyr Glu Cys
 385 390 395 400

230295.sequence listing

His Ile Cys His Thr Arg Phe Thr Gln Ser Gly Thr Met Lys Ile His
405 410 415

Ile Leu Gln Lys His Gly Glu Asn Val Pro Lys Tyr Gln Cys Pro His
420 425 430

Cys Ala Thr Ile Ile Ala Arg Lys Ser Asp Leu Arg Val His Met Arg
435 440 445

Asn Leu His Ala Tyr Ser Ala Ala Glu Leu Lys Cys Arg Tyr Cys Ser
450 455 460

Ala Val Phe His Glu Arg Tyr Ala Leu Ile Gln His Gln Lys Thr His
465 470 475 480

Lys Asn Glu Lys Arg Phe Lys Cys Lys His Cys Ser Tyr Ala Cys Lys
485 490 495

Gln Glu Arg His Met Thr Ala His Ile Arg Thr His Thr Gly Glu Lys
500 505 510

Pro Phe Thr Cys Leu Ser Cys Asn Lys Cys Phe Arg Gln Lys Gln Leu
515 520 525

Leu Asn Ala His Phe Arg Lys Tyr His Asp Ala Asn Phe Ile Pro Thr
530 535 540

Val Tyr Lys Cys Ser Lys Cys Gly Lys Gly Phe Ser Arg Trp Ile Asn
545 550 555 560

Leu His Arg His Ser Glu Lys Cys Gly Ser Gly Glu Ala Lys Ser Ala
565 570 575

Ala Ser Gly Lys Gly Arg Arg Thr Arg Lys Arg Lys Gln Thr Ile Leu
580 585 590

Lys Glu Ala Thr Lys Gly Gln Lys Glu Ala Ala Lys Gly Trp Lys Glu
595 600 605

Ala Ala Asn Gly Asp Glu Ala Ala Ala Glu Glu Ala Ser Thr Thr Lys
610 615 620

Gly Glu Gln Phe Pro Gly Glu Met Phe Pro Val Ala Cys Arg Glu Thr
625 630 635 640

Thr Ala Arg Val Lys Glu Glu Val Asp Glu Gly Val Thr Cys Glu Met
Page 5

645

230295.sequence listing
650

655

Leu Leu Asn Thr Met Asp Lys
660<210> 3
<211> 2337
<212> DNA
<213> Mouse

```

<400> 3
ccattttgtg caccttgatc aaagcccatg tctactaggc cccagcacct ctgcacccca    60
taaagattgc acgctctttt tccatcaggg gtcgtcacca tggctgccgc tgaggtccct    120
gtcccttctg ggtacttcac ccagatcaaa gagcagaagt tgaagcctgg agacctagag    180
gaggagaaag aggaggacgg ggtacaaaga gtggaagccc aggagggagt tgtcaaggag    240
gtggaggccg agaacagttg cctgcttctg gaggccaggg ccccggtgga gagcgacagg    300
cggatcctga ccctgcaaac ggtgcacctg gagtcccagg atgtgcacct acaggggctg    360
ggatggctga gcgtgccaca ctctgaggag ctttcagggg cggtaccaga ggcggaaggc    420
atactgcagt tgccatccgt gctgtggctc gaccagagac cccagctcag ctttcagcat    480
tgcgtgacgg tcagcatccc ggaagagctg taccaccag aggagctgca gcggatacat    540
tttcacctgc tgagagagaa tgtgctaata gccgaggaga acccagagtt aacaccagac    600
ttggacgaaa gcacagccct gaaaaagccc gaagaagatg aaaaggacca gctcccgccc    660
caggagagaga cagacaagag agaagagagg ttgctccttc tggaaatgaa accaaaagag    720
ggaaaagacg acgaaattgt cctgaccatt tcccatctaa gcctcgaaga acagcaagat    780
ccaccagcgg ccaatcagac aagtgtgccg ggagccaaag ccgcaaaacc aaaacggcgg    840
aggcagacca agggaaaagcc tcagagcttt cagtgtgaca cctgcccgtt cacttcctcc    900
aagctctcaa ctttcaatcg tcacatcaaa attcacagca atgagaggcc acacctgtgt    960
cacctgtgcc tgaaggcctt ccggactgtc actcttctta ggaaccatgt gaacaccac    1020
acaggaacca ggccccacaa gtgcaggacg tgcgacatgg cgtttgtcac cagcggagaa    1080
ctcgtccggc acaggcgta caaacacact tatgagaagc ctttcaagtg ctccctgtgc    1140
aagtacgcca gcgtcgaggc aagcaagatg aagcgtcaca tccgctcaca cacgggtgag    1200
cgtcccttcc agtggttgcca gtgtgcttat gccagcaggg actcctacaa gctgaagcgc    1260
cacatgagga cacactcagg tgagaagccg tatgaatgtc ccacctgtca cgtccggttc    1320
acccagagcg ggaccatgaa aatccatata gcacagaagc acggagagaa tgtgcccaaa    1380
tacgagtgtc cccactgtgc caccatcatc gcgaggaaga gcgacctgcg tgtccatctg    1440
cgtaacctgc acagccagag cccggaggag atgaagtgcc gatactgtcc cgctggcttc    1500

```

230295.sequence listing

```

catgagcgct atgccctcat tcagcaccag aggacccaca agaacgagaa gaagttcaag 1560
tgcaagcagt gcgattacgc gtgcaagcag gagcgatgct tgaaggcgca catgcgcatg 1620
cacacaggag agaagccctt ctctgcctg gcctgcaaca agcacttccg acagaagcag 1680
ctactgaccg tgcacctgag gaagtaccat gacccgaact tcgtcccca tctgcacctg 1740
tgcctcaagt gtgataaacg tttctcccg tggagtaacc tgcagagaca cagaaagaag 1800
tgtgacccgg agcatgagac gttagcccc aacaaggaca ggagaccagt gacaaggaca 1860
caggcctcgg agggagaagc aggacacaag gaaggggagc ctcaagtgcc tggggagcag 1920
gctctgggcc accaaggaga agcagcgggg agccagagcc cagaccacgg ccttacctgc 1980
gagatgatct ttaacatgat ggataagtga tggataagtg agcagtcgtg cctctccgtg 2040
cagtggcctc tgggggaaga aaccagttag aaataagttc ccagacacag cacagtgttc 2100
tcagagtttg agatagtgtg tagaaatggt tgagagaagg ggaaaaaac cctgcagcta 2160
tttccaaaga cttgagtcag agctcgaagt gaagggtgcac atatctgggc cctagcaggt 2220
gcccagaatg agtcaggac agattctagg tgatacttat gtccacgggg gctcagacca 2280
gttaacgcct tggtggtcag agcagaaaat tttttgagtt gttgtacca ccctcaa 2337

```

<210> 4
 <211> 636
 <212> PRT
 <213> Mouse

<400> 4

Met Ala Ala Ala Glu Val Pro Val Pro Ser Gly Tyr Phe Thr Gln Ile
 1 5 10 15

Lys Glu Gln Lys Leu Lys Pro Gly Asp Leu Glu Glu Glu Lys Glu Glu
 20 25 30

Asp Gly Val Gln Arg Val Glu Ala Gln Glu Gly Val Val Lys Glu Val
 35 40 45

Glu Ala Glu Asn Ser Cys Leu Leu Glu Ala Arg Ala Pro Val Glu
 50 55 60

Ser Asp Arg Arg Ile Leu Thr Leu Gln Thr Val His Leu Glu Ser Gln
 65 70 75 80

Asp Val His Leu Gln Gly Leu Gly Trp Leu Ser Val Pro His Ser Glu
 85 90 95

Glu Leu Ser Gly Thr Val Pro Glu Ala Glu Gly Ile Leu Gln Leu Pro
 100 105 110

230295.sequence listing

Ser Val Leu Trp Leu Asp Pro Glu Pro Gln Leu Ser Leu Gln His Cys
115 120 125

Val Thr Val Ser Ile Pro Glu Glu Leu Tyr Pro Pro Glu Glu Leu Gln
130 135 140

Arg Ile His Phe His Leu Leu Arg Glu Asn Val Leu Met Ala Glu Glu
145 150 155 160

Asn Pro Glu Leu Thr Pro Asp Leu Asp Glu Ser Thr Ala Leu Lys Lys
165 170 175

Pro Glu Glu Asp Glu Lys Asp Gln Leu Pro Pro Gln Gly Glu Thr Asp
180 185 190

Lys Arg Glu Glu Arg Leu Leu Leu Leu Glu Met Lys Pro Lys Glu Gly
195 200 205

Lys Asp Asp Glu Ile Val Leu Thr Ile Ser His Leu Ser Leu Glu Glu
210 215 220

Gln Gln Asp Pro Pro Ala Ala Asn Gln Thr Ser Val Pro Gly Ala Lys
225 230 235 240

Ala Ala Lys Pro Lys Arg Arg Arg Gln Thr Lys Gly Lys Pro Gln Ser
245 250 255

Phe Gln Cys Asp Thr Cys Pro Phe Thr Ser Ser Lys Leu Ser Thr Phe
260 265 270

Asn Arg His Ile Lys Ile His Ser Asn Glu Arg Pro His Leu Cys His
275 280 285

Leu Cys Leu Lys Ala Phe Arg Thr Val Thr Leu Leu Arg Asn His Val
290 295 300

Asn Thr His Thr Gly Thr Arg Pro His Lys Cys Arg Asp Cys Asp Met
305 310 315 320

Ala Phe Val Thr Ser Gly Glu Leu Val Arg His Arg Arg Tyr Lys His
325 330 335

Thr Tyr Glu Lys Pro Phe Lys Cys Ser Leu Cys Lys Tyr Ala Ser Val
340 345 350

Glu Ala Ser Lys Met Lys Arg His Ile Arg Ser His Thr Gly Glu Arg
355 360 365

230295.sequence listing

Pro Phe Gln Cys Cys Gln Cys Ala Tyr Ala Ser Arg Asp Ser Tyr Lys
370 375 380

Leu Lys Arg His Met Arg Thr His Ser Gly Glu Lys Pro Tyr Glu Cys
385 390 400

Pro Thr Cys His Val Arg Phe Thr Gln Ser Gly Thr Met Lys Ile His
405 410 415

Ile Ala Gln Lys His Gly Glu Asn Val Pro Lys Tyr Glu Cys Pro His
420 425 430

Cys Ala Thr Ile Ile Ala Arg Lys Ser Asp Leu Arg Val His Leu Arg
435 440 445

Asn Leu His Ser Gln Ser Pro Glu Glu Met Lys Cys Arg Tyr Cys Pro
450 455 460

Ala Gly Phe His Glu Arg Tyr Ala Leu Ile Gln His Gln Arg Thr His
465 470 475 480

Lys Asn Glu Lys Lys Phe Lys Cys Lys Gln Cys Asp Tyr Ala Cys Lys
485 490 495

Gln Glu Arg Cys Leu Lys Ala His Met Arg Met His Thr Gly Glu Lys
500 505 510

Pro Phe Ser Cys Leu Ala Cys Asn Lys His Phe Arg Gln Lys Gln Leu
515 520 525

Leu Thr Val His Leu Arg Lys Tyr His Asp Pro Asn Phe Val Pro Asn
530 535 540

Leu His Leu Cys Leu Lys Cys Asp Lys Arg Phe Ser Arg Trp Ser Asn
545 550 555 560

Leu Gln Arg His Arg Lys Lys Cys Asp Pro Glu His Glu Thr Leu Ala
565 570 575

Pro Asn Lys Asp Arg Arg Pro Val Thr Arg Thr Gln Ala Ser Glu Gly
580 585 590

Glu Ala Gly His Lys Glu Gly Glu Pro Gln Cys Pro Gly Glu Gln Ala
595 600 605

Leu Gly His Gln Gly Glu Ala Ala Gly Ser Gln Ser Pro Asp His Gly
Page 9

230295.sequence listing

610

615

620

Leu Thr Cys Glu Met Ile Phe Asn Met Met Asp Lys
625 630 635

<210> 5
<211> 44
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 5
ctagagcccc tcggccgccc cctcgcggcg cgccctcccc gctt

44

<210> 6
<211> 22
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 6
gagcctgtgg agcgattaaa cc

22

<210> 7
<211> 15
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 7
ccgccgccgc tccac

15

<210> 8
<211> 20
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 8
cttctttggc ggcagcggcg

20

<210> 9
<211> 17
<212> DNA
<213> Artificial

<220>
<223> Synthetic

230295.sequence listing

<400> 9 cgcgccacac cccccgc	17
<210> 10 <211> 14 <212> DNA <213> Artificial	
<220> <223> Synthetic	
<400> 10 ccccagaacc agac	14
<210> 11 <211> 17 <212> DNA <213> Artificial	
<220> <223> Synthetic	
<400> 11 acttcagtct tcattctg	17
<210> 12 <211> 20 <212> DNA <213> Artificial	
<220> <223> Synthetic	
<400> 12 tgtgagcttt gcagttacac	20
<210> 13 <211> 18 <212> DNA <213> Artificial	
<220> <223> Synthetic	
<400> 13 actgttctga atgccctg	18
<210> 14 <211> 16 <212> DNA <213> Artificial	
<220> <223> Synthetic	
<400> 14 cggcgttcaa atttgg	16

230295.sequence listing

<210> 15
 <211> 20
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 15
 cgagtacctg tgtgtgtgtt 20

<210> 16
 <211> 15
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 16
 gtgcccagac tgcga 15

<210> 17
 <211> 17
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 17
 aatcgacat ggaacac 17

<210> 18
 <211> 17
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 18
 ttcaagtgtt ccatgtg 17

<210> 19
 <211> 18
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 19
 ctgctggcat aactgcac 18

<210> 20
 <211> 19

230295.sequence listing

<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 20
cacatacaag ctgaaaagg 19

<210> 21
<211> 18
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 21
gcattcttcac ggtaccac 18

<210> 22
<211> 19
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 22
gtcatagccc gaaaaagtg 19

<210> 23
<211> 17
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 23
cgctcatgaa acacagc 17

<210> 24
<211> 18
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 24
gtgtgaccag tgtgatta 18

<210> 25
<211> 17
<212> DNA
<213> Artificial

230295.sequence listing

<220>		
<223>	Synthetic	
<400>	25	
	ttctggcgga aggtctt	17
<210>	26	
<211>	17	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Synthetic	
<400>	26	
	caagcgctat cacgacc	17
<210>	27	
<211>	17	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Synthetic	
<400>	27	
	tctgcatgtc ttgccat	17
<210>	28	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Synthetic	
<400>	28	
	tcctctgaca gtgaaaatgc	20
<210>	29	
<211>	18	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Synthetic	
<400>	29	
	cacaggctga ggctctgg	18
<210>	30	
<211>	19	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Synthetic	

230295.sequence listing

<400> 30		
cagaatacag gtgcaattg		19
<210> 31		
<211> 18		
<212> DNA		
<213> Artificial		
<220>		
<223> Synthetic		
<400> 31		
caccggtcca tcatgctg		18
<210> 32		
<211> 27		
<212> DNA		
<213> Artificial		
<220>		
<223> Synthetic		
<400> 32		
gccagtgtgg aggcaagtaa attgaag		27
<210> 33		
<211> 29		
<212> DNA		
<213> Artificial		
<220>		
<223> Synthetic		
<400> 33		
cactggcaac actgaaaggg gcgctcccc		29
<210> 34		
<211> 22		
<212> DNA		
<213> Artificial		
<220>		
<223> Synthetic		
<400> 34		
tcgtcatatg aaaactcaca cc		22
<210> 35		
<211> 19		
<212> DNA		
<213> Artificial		
<220>		
<223> Synthetic		
<400> 35		
gacgagttct ccactggtg		19

230295.sequence listing

<210> 36
 <211> 20
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 36
 aacataactca tgagaaaccc 20

<210> 37
 <211> 18
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 37
 gagtgcgttc tcatgtgg 18

<210> 38
 <211> 18
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 38
 gagcgcccct ttcagtgt 18

<210> 39
 <211> 15
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 39
 gcacaatggg gacac 15

<210> 40
 <211> 21
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic

<400> 40
 acccagagcg ggaccatgaa a 21

<210> 41
 <211> 19

230295.sequence listing

<212> DNA
 <213> Artificial

 <220>
 <223> Synthetic

 <400> 41
 gacagcagaa cagtagcgg 19

<210> 42
 <211> 18
 <212> DNA
 <213> Artificial

 <220>
 <223> Synthetic

 <400> 42
 cataagaatg agaagagg 18

<210> 43
 <211> 19
 <212> DNA
 <213> Artificial

 <220>
 <223> Synthetic

 <400> 43
 aagttgcttc tgtcggaaa 19

<210> 44
 <211> 21
 <212> DNA
 <213> Artificial

 <220>
 <223> Synthetic

 <400> 44
 ttgtgcagtt atgccagcag g 21

<210> 45
 <211> 22
 <212> DNA
 <213> Artificial

 <220>
 <223> Synthetic

 <400> 45
 gtgcttctgt aaaatgtgca tc 22

<210> 46
 <211> 27
 <212> DNA
 <213> Artificial

230295.sequence listing

```

<220>
<223> Synthetic

<400> 46
caggccctac aagtgtaacg actgcaa 27

<210> 47
<211> 27
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 47
gcattcgtaa ggcttctcac ctgagtg 27

<210> 48
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 48
gagagacaga caagagagaa gagagggtgc tc 32

<210> 49
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Synthetic

<400> 49
cctgtgtggg tggtcacatg gttcctaaga ag 32

```